

Borehole

# 51-18-07

Log Event A

## Borehole Information

Farm : <u>TX</u>	Tank : <u>TX-118</u>	Site Number : <u>299-W15-124</u>
N-Coord : <u>42,020</u>	W-Coord : <u>75,976</u>	TOC Elevation : <u>668.77</u>
Water Level, ft :	Date Drilled : <u>9/30/1970</u>	

## Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>100</u>	

## Borehole Notes:

The borehole was drilled in early September 1970 and was completed to 100 ft with 6-in. casing. The driller's log makes no reference to perforations or grout; therefore, it is assumed that the borehole was not perforated or grouted.

The casing thickness is assumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. casing.

The zero reference for the SGLS logs is the top of the casing. The top of the casing is level with the ground surface.

## Equipment Information

Logging System : <u>2</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>11/1995</u>	Calibration Reference : <u>GJPO-HAN-3</u>	Logging Procedure : <u>P-GJPO-1783</u>

## Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>4/23/1996</u>	Logging Engineer: <u>Kim Benham</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>57.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>4/24/1996</u>	Logging Engineer: <u>Kim Benham</u>
Start Depth, ft.: <u>99.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>56.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>



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### Analysis Information

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Analyst : D.L. Parker

Data Processing Reference : P-GJPO-1787

Analysis Date : 1/23/1997

#### Analysis Notes :

The borehole was logged in two log runs with a centralizer used for each log run. The pre- and post-survey field verification spectra for each log run met the acceptance criteria established for peak shape and system efficiency. The energy and peak-shape calibration from the post-survey field verification spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during log run one. The energy and peak-shape calibration from the pre-survey field verification spectra were used to establish the channel-to-energy parameters used in the processing the spectra acquired during log run two.

Casing correction factors for a 0.280-in.-thick casing were applied during the analysis.

A depth overlap, where data were collected at the same depth on both logging runs, occurred from 56 to 57 ft. The concentrations of the naturally occurring radionuclides were calculated using the separate data sets at the overlapping depths. The calculated concentrations at the overlapping depths were within the statistical uncertainty of the measurements for all measurements except for U-238 and Th-232 at a depth of 57 ft.

Cs-137 was the only man-made radionuclide encountered in this borehole. Cs-137 contamination was detected continuously from the ground surface to about 25 ft and 25.5 to 28 ft. Single detections of Cs-137 were detected at about 34 and 99 ft (the bottom of the borehole). The maximum Cs-137 concentration was about 8 pCi/g at the ground surface.

The logs of the naturally occurring radionuclides show a pronounced increase in K-40 concentrations at about 48 ft. A less pronounced increase in Th-232 concentrations was also shown at about this depth.

The U-238 concentrations increase steadily from about 50 to 99 ft (the bottom of the borehole), with the maximum concentration of 2.2 pCi/g at about 98 ft. Th-232 concentrations increase from 90 to 92 ft and 95 to 99 ft.

The SGLS total count log plot reflects the log plots of the man-made and naturally occurring radionuclides. The upper 25 ft of the total count log reflects the Cs-137 concentrations. The total count log plot shows a marked increase in activity at a depth of about 48 ft, reflecting the increase in K-40 concentrations. The total count log plot below about 88 ft reflects concentrations shown on the U-238 and Th-232 plots.

Details concerning the interpretation of data for this borehole are presented in the Tank Summary Data Report for tank TX-118.

#### Log Plot Notes:

Separate log plots show the man-made (Cs-137) and the naturally occurring radionuclides (KUT). The naturally occurring radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the minimum detection limit (MDL). The MDL of a radionuclide



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represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes both the man-made and naturally occurring radionuclides, the total count log plot, as well as the Tank Farm gross-gamma log. The Tank Farm gross-gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma log plot to coincide with the SGLS data.